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# **Hitachi Gigabit Router GR2000 Series Enhanced Version**

**Routing Software 06-02 (OS3)**

**Installation Guide**

**S-9181-31X**

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## Preface

This description explains methods used to install this version of the routing software in a new MC and to update the routing software from an old version to this version. Be sure to read this description before updating or installing it.

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## Abbreviations

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
AFI	Authority and Format Indicator
AIS	Alarm Indication Signal
ANSI	American National Standards Institute
ARP	Address Resolution Protocol
AS	Autonomous System
ATM	Asynchronous Transfer Mode
BECN	Backward Explicit Congestion Notification
BGP	Border Gateway Protocol
BGP4	Border Gateway Protocol 4
BOD	Bandwidth On Demand
BPDU	Bridge Protocol Data Unit
CATV	Cable Television
CBR	Constant Bit Rate
CIDR	Classless Inter-Domain Routing
CIR	Committed Information Rate
CLLM	Consolidated Link Layer Management
CLNP	Connectionless Network Protocol
CLP	Cell Loss Priority
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
DA	Destination Address
DCC	Data Country Code
DCE	Data Circuit terminating Equipment
DDP	Datagram Delivery Protocol
DHCP	Dynamic Host Configuration Protocol
DLCI	Data Link Connection Identifier
DSAP	Destination Service Access Point
DSP	Domain Specific Part
DSU	Digital Service Unit
DTE	Data Terminal Equipment
DVMRP	Distance Vector Multicast Routing Protocol
ELAN	Emulated LAN

ERP	Echo Response
ERQ	Echo Request
ES	End System
FCS	Frame Check Sequence
FDB	Filtering Data Base
FDDI	Fiber Distributed Data Interface
FERF	Far End Receive Failure
HDLC	High-level Data Link Control
HNA	Hitachi Network Architecture
ICMP	Internet Control Message Protocol
IDI	Initial Domain Identifier
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IETF	the Internet Engineering Task Force
IGMP	Internet Group Management Protocol
ILMI	Interim Local Management Interface
IP	Internet Protocol
IPX	Internetwork Packet Exchange
ISO	International Organization for Standardization
ISP	Internet Service Provider
ITU-T	International Telecommunication Union - Telecommunication, Standardization Sector
JDI	Japanese Domain Identifier
LAN	Local Area Network
LAPB	Link Access Procedure Balanced Mode
LCP	Link Control Protocol
LEC	LAN Emulation Client
LES	LAN Emulation Server
LIS	Logical IP Subnetwork
LLB	Local Loop Back
LLC	Logical Link Control
LQM	Link Quality Monitoring
LQR	Link Quality Report
MAC	Media Access Control
MC	Memory Card
MD5	Message Digest 5
MIB	Management Information Base

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MMF	Multi Mode Fiber
MRU	Maximum Receive Unit
NSAP	Network Service Access Point
MTU	Maximum Transfer Unit
NBP	Name Binding Protocol
NCP	Network Control Protocol
NET	Network Entity Title
NetBIOS	Network Basic Input/Output System
NIF	Network Interface board
NRZ	Non-Return-to-Zero
NSAP	Network Service Access Point
OC-3c	Optical Carrier level 3 concatenation
OC-12c	Optical Carrier level 12 concatenation
OAM	Operation Administration and Management
OSI	Open Systems Interconnection
OSPF	Open Shortest Path First
OUI	Organizationally Unique Identifier
PC	Personal Computer
PDB	Permanent Data Base
PHY	PHYsical layer protocol
PID	Protocol IDentifier
PIM-DM	Protocol Independent Multicast-Dense Mode
PLD	Programmable Logic Design
POS	PPP over SONET/SDH
PPP	Point-to-Point Protocol
PPS	Packet Per Second
PVC	Permanent Virtual Channel (Connection)/Permanent Virtual Circuit
QoS	Quality of Service
RFC	Request For Comments
RIP	Routing Information Protocol
RLB	Remote Loop Back
RM	Routing Manager
RP	Routing Processor
SA	Source Address
SAP	Service Access Point

SD	Start Delimiter
SDH	Synchronous Digital Hierarchy
SDLC	Service Advertising Protocol
SD-I	Super Digital I interface
SFD	Start Frame Delimiter
SMF	Single Mode Fiber
SNA	Systems Networking Architecture
SNAP	Sub-Network Access Protocol
SNMP	Simple Network Management Protocol
SONET	Synchronous Optical Network
SPF	Shortest Path First
SPT	Spanning Tree
SPX	Sequenced Packet Exchange
SSAP	Source Service Access Point
SSP	Switch to Switch Protocol
SVC	Switched Virtual Channel (Connection)
TA	Terminal Adapter
TCC	Transmission Control Character
TCP/IP	Transmission Control Protocol/Internet Protocol
TOS	Type Of Service
TTC	Telecommunication Technology Committee
TTL	Time To Live
UBR	Unspecified Bit Rate
UDP	User Datagram Protocol
UNI	User Network Interface
VC	Virtual Channel/Virtual Call
VCI	Virtual Channel Identifier
VP	Virtual Path
VPI	Virtual Path Identifier
WAN	Wide Area Network
WS	Work Station
WWW	World-Wide Web
xDSL	x Digital Subscriber Line



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# 1 Update and Installation Procedures

## 1.1 Notes When Updating and Installing

1. While installing, do not pull out and insert an MC card, and do not turn off and on the GR2000.
2. Do not execute a `ppupdate` command in the multiple login condition.
3. Figure 1-1 shows a transfer of a file from a PC. Always use the binary mode when transferring files by the file transfer protocol (FTP). If the FTP fails, restart the FTP from the beginning. After transferring files, check if the file transfer is has terminated normally. Check that the file size displayed with a `ls -l` command is equal to that of the file for software update in the CD-ROM. If the file size is not correct, it is assumed that the file transfer mode is not set in a binary mode or the capacity of free space in the MC before file transfer is smaller than that of the file for software update. Enter `rm file name` to delete the files, then transfer the update files again.
4. When transferring the files with an FTP, a password must be set for the login user in advance. If a password is not yet set, an FTP client cannot log into the GR2000.
5. Transfer files used for update and installation to a place under the `/primaryMC/usr/var/update` directory in the GR2000 by the file name of `UPDATE.tgz`.

```
C:\WINDOWS> e:      (In the case where a CD-ROM is assigned to the E drive)
E:\> cd ALL
E:\> ftp 192.168.1.1  (In the case where the IP address of the GR2000 is 192.168.1.1)
User (192.168.1.1:(none)): operator  (Specifies the login name of the GR2000.)
Password:*****  (Specifies the password.)
ftp> bin
ftp> put BA51D.tgz /primaryMC/usr/var/update/UPDATE.tgz
ftp> bye
```

**Figure 1-1 Example of Transferring a File from a PC Running Windows95 to Initiate a MS-DOS prompt.**

6. An MC64 is required for installing this version of the software. The MC30 does not have the capacity for this installation.
7. When making an update to the primary MC of the standby system, the standby system will automatically start, resulting in the following log being taken on the active system:  
E5 RM 01300403 1003:000000000000 Fatal error is detected on mate system  
Do not consider this a problem.
8. Before performing update, execute an `ls /usr/var/core` command to make sure that no program dump file is present in the `/usr/var/core` directory. If a program dump file is present in this directory, send this file to your service representative. The service representative in turn sends it to his support center. After sending the file, execute an `rm /usr/var/core/*` to delete the file and secure a capacity of free space in the MC, and then perform update.
9. Once you log in to a GR2000 from a management terminal with a `telnet` or `rlogin` and execute a `ppupdate` command, do not break the telnet or rlogin connection from the terminal side until the `ppupdate` command terminates and the command prompt returns, or until the connection is broken from the GR2000 by an

automatic restart. If the connection is broken, the ppupdate command does not terminate to fail in updating, and restoration of the GR2000 may be disabled.

10. If a message "Invalid contents of UPDATE.tgz" is displayed while executing ppupdate command, follow the instructions below:

Transfer the update file again to the user's home directory, then execute command `cmp ~/UPDATE.tgz /primaryMC/usr/var/update/UPDATE.tgz` to compare files.

If the command completes without displaying any messages, execute the ppupdate command again.

If some error messages are displayed before the cmp command completes, execute `cp ~/UPDATE.tgz /primaryMC/usr/var/update/UPDATE.tgz` and then execute the ppupdate command again.

## 2 Updating Software

The update procedure varies with the configuration of the GR2000 in current use. Use the files listed in Table 2-1 to update the software. In addition, check the configuration of the RM and MC card, and then update software by a procedure suitable for the configuration in Table 2-2.

**Table 2-1 Files Required for Updating**

No.	Directory in CD-ROM	File Name
1	All	BA62.tgz

**Table 2-2 Device Configuration, Version of Routing Software, and Update Procedure**

No.	Device Configuration	Update Procedure
1	One RM in the router and two MCs in use	Update procedure 1
2	One RM in the router and one MC in use	Update procedure 2
3	Two RMs in the router and two MCs in use for each RM	Update procedure 3
4	Two RMs in the router and one MC in use for each RM	Update procedure 4

Table 2-3 shows versions which can be updated from and free MC space required for updating. Note that 1K is equal to 1024 bytes.

**Table 2-3 Free MC Space Required for Updating**

No.	Earlier Version	MC Capacity	Updating Boot ROM
1	03-00-F	8562K Bytes	Executed
2	03-03-/A	6649K Bytes	Executed
3	03-03-/D	6640K Bytes	Executed
4	04-01	5552K Bytes	Executed
5	04-01-/D	5477K Bytes	None

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When the target of the update is S-9181-31X (ROUTE-OS3-X), Table 2-4 shows the available update versions, available MC capacity, and execution of the updating boot ROM on the CPU board. Note that 1K is equal to 1024 bytes.

**Table 2-4 Free MC Space Required for Updating**

No.	Earlier Version	MC Capacity	Updating Boot ROM
1	04-00-/B	4715K Bytes	Executed
2	05-00-/B	3632K Bytes	None
3	05-01-/A	1723K Bytes	None
4	06-00	1432K Bytes	None

When the target of the update is S-9181-61X (ROUTE-OS6-X), Table 2-5 shows the available update versions, available MC capacity, and execution of the updating boot ROM on the CPU board. Note that 1K is equal to 1024 bytes.

**Table 2-5 Free MC Space Required for Updating**

No.	Earlier Version	MC Capacity	Updating Boot ROM
1	04-00-/C	4046K Bytes	Executed
2	05-00-/A	2886K Bytes	None
3	05-01-/A	985K Bytes	None
4	06-00	500K Bytes	None
5	06-01-/B	500K Bytes	None

Note that when executing an update of the boot ROM, it will take one extra minute to update the primary MC.

## 2.1 Update Procedure 1

This is an update procedure for a GR2000 that is configured from one RM using two MCs. It updates the backup and current MCs, both with an old version of software stored in them. After the update for the current MC is complete, the GR2000 automatically restarts. Upon restart, communication is interrupted temporarily. Do not pull out and insert an MC card while updating the software.

1. Log into a GR2000 with a user ID that the user has set (for example, *operator*).
2. Enter a admin command. The command prompt changes to `admin:`.
3. Execute a version command to check that the version in current use is one of software versions from which the update is allowed as listed in Table 2-3.
4. Execute an information router command to check that individual capacities of free space in MC0 and MC1 of rm0 are equal to or larger than the capacity listed in Table 2-3.
5. Execute a synchronize `-s` secondary command to check that the current MC is identical to the backup MC in the configuration definition, the password file, and the user account. If not identical, execute a synchronize `-a` secondary command to make them identical to each other.
6. Transfer with FTP the files listed in Table 2-1 to a place under the `/primaryMC/usr/var/update` directory in the GR2000 by the file name of `UPDATE.tgz` (be sure to transfer in the binary mode).
7. Execute `ls -l /primaryMC/usr/var/update` to check that the size of transferred files is the same as the size of files in the CD-ROM individually.
8. Enter `cd /primaryMC/usr/var/update` to change to the relevant directory.
9. Execute `ppupdate UPDATE.tgz secondary act` to update the backup MC.
10. Execute `ppupdate UPDATE.tgz primary act` to update the current MC.
11. After completion of the update, the message `Reboot active RM after 30 seconds` is displayed. The GR2000 automatically restarts 30 seconds later.
12. The update of the MCs is now complete. After the GR2000 restarts, log in again, and execute a version command to check that the GR2000 is operating with the new version.

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## 2.2 Update Procedure 2

This update procedure is for a GR2000 configured from one RM using one MC. It updates the current MC card with an old version of software stored in it. After the updating procedure for the current MC is complete, the GR2000 automatically restarts. Upon restart, communication is interrupted temporarily. Do not pull out and insert an MC card while updating the software.

1. Log into a GR2000 with a user ID that the user has set (for example, operator).
2. Enter an admin command. The command prompt changes to admin:.
3. Execute a version command to check that the version in current use is one of software versions from which the update is allowed as listed in Table 2-3.
4. Execute an information router command to check that the capacity of free space in MC0 of rm0 is equal to or larger than the capacity listed in Table 2-3.
5. Using FTP, transfer the files listed in Table 2-1 to a place under the */primaryMC/usr/var/update* directory in the GR2000 by the file name of *UPDATE.tgz* (be sure to transfer in the binary mode).
6. Execute *ls -l /primaryMC/usr/var/update* command to check that the size of transferred files is the same as the size of files in the CD-ROM individually.
7. Enter *cd /primaryMC/usr/var/update* to change to the relevant directory.
8. Execute a *ppupdate UPDATE.tgz primary act* command to update the current MC.
9. After completion of updating, the message *Reboot active RM* after 30 seconds will be displayed, and the GR2000 will automatically restart 30 seconds later.
10. The update of the MC is now complete. After the GR2000 restarts, log in again and execute a version command to check that the GR2000 is operating with new version.

## 2.3 Update Procedure 3

This update procedure is for a GR2000 that is configured from two RMs, each using two MCs. It updates the backup and current MC cards, both with an old version of software stored in them for individual RMs of the active and standby systems. After the update procedure for the current MC is complete, the GR2000 automatically restarts. Upon restart, communication is interrupted temporarily. Do not pull out and insert an MC card while updating the software.

1. Log into a GR2000 with a user ID that the user has set (for example, *operator*).
2. Enter an admin command. The command prompt changes to *admin:*.
3. Execute a version command to check that the version in current use is one of software versions from which the update is allowed as listed in Table 2-3.
4. Execute an information router command to check that individual capacities of free space in MC0's and MC1's of *rm0* and *rm1* are equal to or larger than the capacity listed in Table 2-3.
5. Execute a *synchronize -s secondary* command, a *synchronize -s standby:primary* command, and a *synchronize -s standby:secondary* command to check that the current MC of the active system is identical to the backup MC of the active system, and also that the MCs of the standby systems in the configuration definition, the password file, and the user account are identical. If not identical, execute a *synchronize -a secondary* command, a *synchronize -a standby:primary* command, and a *synchronize -a standby:secondary* command to make them identical to each other.
6. Using FTP, transfer the files listed in Table 2-1 to a place under the */primaryMC/usr/var/update* directory in the GR2000 by the file name of *UPDATE.tgz* (be sure to transfer in the binary mode).
7. Execute a *ls -l /primaryMC/usr/var/update* command to check that the size of transferred files is the same as the size of files in the CD-ROM individually.
8. Enter a *cd /primaryMC/usr/var/update* to move to the relevant directory.
9. Execute a *ppupdate UPDATE.tgz secondary standby* command to update the backup MC in the RM of the standby system.
10. Execute a *ppupdate UPDATE.tgz primary standby* command to update the current MC in the RM of the standby system.
11. After the update procedure for the current MC in the RM of the standby system is complete, the RM of the standby system automatically restarts.
12. Execute a *ppupdate UPDATE.tgz secondary act* command to update the backup MC in the RM of the active system.
13. Execute a *ppupdate UPDATE.tgz primary act* command to update the backup MC in the RM of the active system.
14. After completing the update, the message *Reboot active RM after 30 seconds* is displayed, and the GR2000 automatically restarts 30 seconds later.
15. The update of the MCs is now complete. After the GR2000 restarts, log in again and execute a version command to check that the GR2000 is operating with the new version.



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## 2.4 Update Procedure 4

This is a version-up procedure for a GR2000 that is configured from two RMs, each using one MC. It updates the current MC card with an old version of software stored in it for individual RMs of the active and standby systems. After the updating procedure for the current MC in the RM of the active system is complete, the GR2000 automatically restarts up. Note that when it restarts up, communication is interrupted temporarily. In addition, do not pull out and insert an MC card while updating the software.

1. Log into a GR2000 with a user ID that the user has set (for example, operator).
2. Enter an admin command. The command prompt changes to admin:.
3. Execute a version command to check that the version in current use is one of software versions from which the update is allowed as listed in Table 2-3.
4. Execute a information router command to check that individual capacities of free space in MC0's of rm0 and rm1 are equal to or larger than the capacity listed in Table 2-3 individually.
5. Execute a synchronize `-s standby:primary` command to check that the current MC of the active system is identical to the current MC of the standby systems in the configuration definition, the password file, and the user account. If not identical, execute a synchronize `-a standby:primary` command to make them identical to each other.
6. Using FTP, transfer the files listed in Table 2-1 to a place under the `/primaryMC/usr/var/update` directory in the GR2000 by the file name of `UPDATE.tgz` (be sure to transfer in the binary mode).
7. Execute `ls -l /primaryMC/usr/var/update` to check that the size of transferred files is the same as the size of files in the CD-ROM individually.
8. Enter `cd /primaryMC/usr/var/update` to move to the relevant directory.
9. Execute `ppupdate UPDATE.tgz primary standby` command to update the current MC in the RM of the standby system.
10. After the update procedure for the current MC in the RM of the standby system is complete, the RM of the standby system automatically restarts.
11. Execute `ppupdate UPDATE.tgz primary act` command to update the current MC in the RM of the active system.
12. After completing the update, the message Reboot active RM after 30 seconds is displayed. The GR2000 automatically restart 30 seconds later.
13. The update of the MCs is all-complete. After the GR2000 restarts, log in again and execute a version command to check that the GR2000 is operating with this version.

## 3 Installing Software

When installing this program product in a new MC64, do it by the procedure described below using a backup slot. Table 3-1 lists the files used to install the software.

**Table 3-1 Files used for Installation**

No.	Directory in CD-ROM	Name of File
1	ALL	BA62.tgz

1. Log into a GR2000 with an account that the user has set (for example, operator).
2. Execute a admin command to switch to the admin mode.
3. Insert an MC to be updated into a backup slot.
4. Execute an mc format command to format the MC in the backup slot.
5. Using FTP, transfer the file listed in Table 3-1 to a place under the */primaryMC/usr/var/update* directory in the GR2000 by the file name of *UPDATE.tgz* (be sure to transfer in the binary mode).
6. Execute *ls -l /primaryMC/usr/var/update* to check that the size of transferred files is the same as the size of files in the CD-ROM individually.
7. Enter *cd /primaryMC/usr/var/update* to move to the relevant directory.
8. Execute *ppupdate UPDATE.tgz secondary* to install the software in the backup MC.
9. Execute a synchronize –a secondary command to synchronize the current and backup MCs in terms of the configuration definition files and the password information.
10. The installation is now complete.